

Future Perspectives of Fat Grafting



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KEYWORDS

- Fat grafting • Soft-tissue augmentation • Soft-tissue reconstruction • Regenerative surgery
- Fat grafting research

KEY POINTS

- Future perspectives of fat grafting from 3 editors are summarized in this review. Fat grafting will continue to play an important role in cosmetic and reconstructive surgery.
- Fat grafting can be a good option to replace some of the “traditional” procedures in cosmetic and reconstructive surgery.
- Fat grafting may become a regenerative procedure that can be used to treat varieties of difficult clinical problems that have not been solved at the present time. More definitive studies are still needed in order to answer any specific questions related to fat grafting including the best technique and the role of ADSCs.

INTRODUCTION

Autologous fat grafting has become a popular procedure in both cosmetic and reconstructive plastic surgery. It has been a “hot topic” in almost all major plastic surgery meetings lately and many advances in fat grafting have been made in this exciting field of plastic surgery. Modern fat grafting started as a means for facial rejuvenation and correction for soft tissue counter deformity in the mid 1990s and championed by Coleman. It had a “bad reputation” for years, especially in the United States, as the procedure with unachievable or unpredictable outcome and uncertain safety.¹ However, as we learn more and more about fat grafting and its potential,² many reputable plastic surgeons are able to achieve good to excellent results with the procedure and to expand its role in many other areas of plastic surgery, including cosmetic and reconstructive surgery of the breast.³ In this last article, 3 editors put together their perspective views on future autologous fat grafting.

FACIAL REJUVENATION

Autologous fat grafting will continue to play an important role in facial rejuvenation. As a matter of fact, it will, as a relatively less invasive surgical procedure, gradually replace many open approaches to early or even moderately facial aging.⁴ It will also expand its role in combination with a traditional face lift surgery especially for correction of facial aging in the central portion of the face such as in the lid/cheek junction, tear trough, nasolabial fold, or perioral region because these areas are typically not corrected by a traditional face lift; fat grafting will likely achieve permanent improvement when comparing with a synthetic filler such as hyaluronic acid for the same purpose. Because of the unique regenerative potential of fat, presumably because of the potential effect of adipose derived stem cells, it has a unique feature not only to correct soft tissue deficiency but also to rejuvenate the skin of the face.⁵ It is quite likely that fat grafting will play a more important role in facial rejuvenation and only stromal vascular fraction (SVF) other than fat will be injected for facial

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rejuvenation because of the regenerative potential of adipose derived stem cells within SVF. As surgeons gain more clinical experience and follow their patients for longer term, better results can be achieved by fat grafting in combination with a traditional open procedure for facial rejuvenation than that by an open face lift surgery alone.⁶ It can also be true that fat grafting will replace some of traditional rhinoplasty procedures because it could improve the contour of the nose.⁷

CRANIOFACIAL DEFORMITY

Fat grafting is also going to play an increased role for correction of craniofacial deformities secondary to congenital deformity or traumatic injury. Fat grafting would correct soft tissue deformity and its preliminary results have been amazing.⁸ It can also be an useful alternative to microvascular free tissue transfer to the face with a significant soft tissue deformity.⁹ Fat grafting in combination with a traditional bony craniofacial reconstruction will provide the patient with much better clinical outcome than a traditional craniofacial approach with primary emphasis on bony reconstruction. In addition, the regenerative potential of adipose tissue cannot be replaced by any traditional craniofacial surgical approach in the head and neck region.¹⁰ The regenerative nature of fat has been applied innovatively by our ENT colleagues to treat various vocal cord pathologies with good success and minimal or no serious complications.¹¹ Fat grafting as primary or adjunct procedure will be widely performed for management of many craniofacial pathologies.

COSMETIC AND RECONSTRUCTIVE BREAST SURGERY

The role of fat grafting in cosmetic and reconstructive breast surgery will continue to evolve. It will continue to become a widely used adjunctive procedure to improve the clinical outcome of both cosmetic and reconstructive breast surgery. Fat grafting for primary or secondary breast augmentation will be a common procedure of choice for both patients and plastic surgeons. Fat grafting will become a valid option for correction of lumpectomy defect for treatment of early breast cancer. In addition, fat grafting for total breast reconstruction after mastectomy may become a clinical reality and achieve the clinical outcome and patient satisfaction that cannot be achieved with an implant or flap surgery. The future of fat grafting in cosmetic and reconstructive breast surgery can be further classified into 4 major areas: breast augmentation, breast enhancement, correction of breast asymmetry and congenital deformity, and breast reconstruction.

Breast Augmentation

Although fat grafting for primary breast augmentation had a “bad reputation” in the past, the procedure itself has gained more popularity recently and is being performed more and more by plastic surgeons worldwide for primary breast augmentation.^{1,3} There are adequate studies in the literature to support the efficacy and safety of fat grafting for primary breast augmentation.¹²⁻¹⁴ Although there is lack of standardized technique for fat grafting to the breast, plastic surgeons have improved their surgical technique of fat grafting for primary breast augmentation so that satisfactory results can be achieved in selective patients and there is no need for an implant-based breast augmentation.^{15,16} More study needs to be conducted to further confirm the efficacy and safety of fat grafting as a primary means for breast augmentation. In addition, surgical techniques also need to be standardized to avoid complications and shorten the learning curve in fat grafting for primary breast augmentation.

Breast Enhancement

Fat grafting, as a valid option, will be used widely in conjunction with traditional mastopexy or implant exchange to achieve a better outcome in aesthetic breast surgery.^{17,18} It provides another option to manage “soft tissue deficiency” for selected patients. In addition, the concept of composite breast augmentation with implant and fat grafting has been introduced, which may provide clinical outcome in breast augmentation for selected patients that cannot be achieved by either option alone.¹⁹

Correction of Breast Asymmetry and Congenital Deformity

Fat grafting as a popular procedure will probably replace most of the current techniques for correction of breast asymmetry.²⁰ This might be true for correction of some less significant breast asymmetries. Breast augmentation with implant, mastopexy, or breast reduction will continue to play a role for the correction of significant breast asymmetry. Fat grafting itself will become a primary option for correction of several breast congenital deformities, such as the Poland syndrome or tuberous breast. It will likely correct those congenital deformities without the need for a traditional breast implant or flap reconstruction.²¹

Breast Reconstruction

Fat grafting as a valid procedure will continue to be widely used in reconstructive breast surgery for a final touch up procedure after implant or flap reconstruction.²² It has proven its role in correction

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